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is a distinct change in treatment. Instead of taking the typical ecological regions, a representative plant from each region is made the basis of study. The plants used are cactus (xerophyte), bladderwort (hydrophyte), *Salicornia* (xerophytic hydrophyte), and dodder (a parasite). Such treatment doubtless has distinct advantages, since the beginning student organizes data much more readily around an individual than around such abstractions as hydrophytes, xerophytes, etc. Some may question whether this really gives an adequate presentation of the great ecological divisions, but probably the authors would answer that it is better to have beginners get a definite idea about a few representative plants, than a somewhat hazy idea about a number of plants and definite notions about none of them. When ecology was first introduced into courses of study, it was heralded by some as a means of breaking away from the regulation type study method, and it is especially interesting in this connection to see ecology adopting the type study as the best means of presenting its data to beginners.

The exercises are fairly well written. Each begins with a definite statement of the purpose, and of the materials and apparatus needed for it. The directions for observation and study are very general, but in the hands of a good teacher such directions will stimulate good habits of laboratory study; indeed it seems quite undesirable to attempt to arrange a manual that will not require the presence of a good teacher, since the personal contact of such a teacher is the most important factor in the course.—O. W. CALDWELL.

MINOR NOTICES

A new lilac disease.—KLEBAHN⁴ has described briefly the more common fungi found on lilacs used for winter forcing in Europe. The greater part of the paper is devoted to a new disease caused by *Phytophthora Syringae*. The fungus infects the twigs of the lilac plants, killing them over a distance of several internodes. Usually the upper internodes are killed, but often parts of the stems lower down are killed. The flower buds on the infected twigs do not develop, so that only leafy shoots are produced from lower uninjured buds. Since the value of a forcing lilac depends largely on the symmetry of the plants and the even distribution of the flowers, great loss is caused by the damage of a few twigs, especially since the injury is not detected until the plants are started into growth. It appears that the greater part of the infection occurs while the plants are in storage. After they are dug up in the fall, it is customary to heel them in in cold frames so that one side of the plants is in contact with the ground. Both observation and experiment showed that it is through contact with the earth that the twigs become infected.

A somewhat lengthy account is given of the characters and biological behavior of the fungus. In the lilac twigs and buds only oospores were found, which led to a former publication describing the fungus as *Ploeophthora Syringae*. In this

⁴ KLEBAHN, H., *Krankheiten des Flieders*. pp. 75. figs. 45. Berlin: Gebrüder Borntraeger. 1909.

investigation the author succeeded in growing the fungus in pure cultures, and thus obtained sporangia belonging to the genus *Phytophthora*. By means of zoospores, not only lilacs but also a number of other plants were infected, showing close relationship of the fungus to *Phytophthora omnivora* DeBary. The relationship is discussed at length, and although the author is somewhat doubtful in his conclusion, he is inclined to regard the fungus as a species (*P. Syringae*) differing slightly in morphological and biological characteristics from DEBARY'S *P. omnivora*.—H. HASSELBRING.

The problems of life.—In 1900 GIGLIO-TOS published the first part of his work under this title.⁵ The general thesis of the book is that vital phenomena are all referable to relatively simple fundamental causes, and in the first part there is an attempt to set forth a logical and consistent hypothesis of the organization of protoplasm and its fundamental functions. The second part appeared in 1903,⁶ and applied the same method to the phenomena of ontogeny. In 1905 the third part was published,⁷ extending the author's hypothesis to the phenomena of fertilization and heredity. Now the fourth and last part has appeared,⁸ and reduces to relative simplicity the important problems of variation and the origin of species. The theory of the whole book begins with an assumption regarding the molecular structure of protoplasm and the nature of assimilation, and applies this assumption by a logical series of deductions to the most fundamental problems of biology. The logic may be good, but it cannot transform the assumption, interesting as it may be, into a fact. Even a fact is influential only in its own immediate neighborhood, and the author has traveled far beyond the region where an initial fact, much less an assumption, can be serviceable.—J. M. C.

A new flora of California.—Two parts of *A flora of California* by JEPSON⁹ have been published recently. Part I contains the families Pinaceae to Taxaceae and Part II the Salicaceae to Urticaceae inclusive. The text is printed in carefully selected type which differentiates admirably the subject matter on the page. The descriptions, while full and accurate, are not overtechnical; the bibliography and synonymy are presented in sufficient detail to give a ready understanding without being cumbersome, and particular emphasis is given to the geographical distribution of species and varieties. Several well reproduced photographs and numerous original figures materially supplement the text. New species are described in *Cupressus* and *Quercus*. The publication happily combines scientific accuracy

⁵ Review in BOT. GAZETTE 31:275. 1901.

⁶ *Ibid.* 37:151. 1904.

⁷ *Ibid.* 41:450. 1909.

⁸ GIGLIO-TOS, ERMANN, Les problèmes de la vie. IV^e partie: La variation et l'origine des espèces. 8vo. pp. vii+222. Cagliari: The author, at the University. 1910. fr. 8.

⁹ JEPSON, W. L., A flora of California. Royal 8vo. Part I, pp. 33-64. figs. 13; Part II, pp. 337-368. figs. 5. San Francisco: Cunningham, Curtiss, and Welch. 1909.